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NOTES FROM PACIFIC COAST OBSERVATORIES.

Note on the Level of Sun-Spots.

A few years ago there was an animated discussion on the level of sun-spots, which did not result in any satisfactory conclusion. While visual and photographic observations, on the whole, seemed to favor the traditional view that spots are depressions in the photosphere, measurements of the intensity of their radiation led to the opinion that they might be elevated regions. · For at increasing distances from the center of the Sun the total radiation of spots was observed to decrease less rapidly than that of the adjoining photosphere. It was therefore supposed that the spots must be raised above the denser part of that absorbing stratum which reduces the brightness of the photosphere at the limb.

Recent observations on Mt. Wilson, made for the most part by Mr. Abbot with the bolometer, have shown that the radiation of sun-spots, as compared with that of the photosphere, is relatively much richer in the less refrangible rays. In other words, the sun-spots would show with but little contrast in a monochromatic red image of the Sun, while they would appear very dark in a violet image. This result is confirmed by our photographs of spot spectra, which require a relatively larger exposure to bring out the umbra in the violet than in the red. There is thus no doubt that spots are relatively richer than the photosphere in red rays.

The knowledge of this fact reduces and probably completely removes the difficulty encountered in the discussion mentioned above. As the absorption at the Sun's limb is known to be much more marked for the short waves than for the long ones, it is evident that the light of spots will suffer less from absorption than the light of the photosphere. There is consequently no necessity of assuming, at least on these grounds, that the level of spots is higher than that of the photosphere. It is hoped that a quantitative study of the question may soon be made.

GEORGE E. HALE.

NEW COMPANIONS TO TWO STRUVE STARS.

Examination with the 36-inch telescope has recently shown that the principal component in each of the two well-known double stars, Σ 1729 and Σ 2668, is itself a close unequal pair. My measures of the old and new companions are as follows:—

Date.	Angle.	Dist.	Magnitudes.	
		Σ 1729.		
		A and B (New).		
1906.50	120°.8	0″.29	8.9-10.3	3^n
		A B and C.		
1906.47	274°.8	8″.46	8.8-11.0	1^n
		Σ 2668.		
		A and B (New).		
1906.54	111°.5	0″.26	7.0-9.0	2^n
		A B and C.		
1906.54	286°.3	3″.26	6.8-9.0	2^n

STRUVE'S measure of the latter pair is, 1831.14 293°.6 3″.30, perhaps indicating very slow motion. Σ 1729 has shown no motion whatever in the seventy-five years since its discovery.

R. G. AITKEN.

July 21, 1906.

A ROAD TO MT. WILSON.

On the occasion of President WOODWARD'S recent visit to the Solar Observatory, it was decided to widen the "New Trail," which ascends from the foot of Eaton Cañon, into a road suitable for the transportation of the heavy castings of the 5-foot reflector mounting. President WOODWARD recommended that Mr. GODFREY SYKES, superintendent of construction at the Desert Botanical Laboratory of the Carnegie Institution, be placed in immediate charge of the work, on account of his skill as an engineer and his experience in the building of trails in Arizona. This was rendered possible through the courtesy of Director MACDOUGAL, of the Botanical Laboratory, who arranged to give Mr. SYKES a leave of absence.